EXECUTIVE SUMMARY

SHOPPING FOR CONSUMER CREDIT: IMPLICATIONS FOR MARKET EFFICIENCY

Debra Drecnik Worden and A. Charlene Sullivan*

In a perfectly efficient financial market the price of a contract is a function of its risk. According to classical theory, this situation prevails when buyers have equal access to complete and costless information about the costs and benefits of competing contracts from a variety of sellers.

There are many barriers which potentially contribute to price inefficiency in the market for consumer credit. Since the market is generally local in nature, differences in local competition may cause the price for credit to vary across borrowers. Another barrier may be proprietary or incomplete information about the credit risk of the borrower. Finally, the complete array of terms for credit contracts is so complex and varied that the consumer may not be able to shop effectively for credit.

Diminishing the first two barriers, technological advances and deregulation are setting the stage for improvements in the price efficiency of the consumer credit market. One function of the Truth in Lending Act (1968), legislation which provides for standardized disclosure of terms so that consumers can compare the price of various consumer credit contracts, was to diminish the third barrier. A reduction in the dispersion of interest rates quoted to a given individual for homogeneous contracts should follow from

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such legislation. In other words, borrowers of similar credit risk would be charged the same interest rate, holding other terms of the contract constant.

Although market efficiency is dependent upon the existence of a variety of sellers, unregulated prices, and available information--consumers' shopping behavior is a key variable in the equation. Since perceived costs and benefits vary across buyers, some will engage in more search activity and be more informed about available prices than others. The existence of less informed buyers allows some sellers to charge higher prices; in other words, it adds to the level of price dispersion and market inefficiency.

To the extent that less informed consumers are not paying the lowest price for credit, given their level of risk, the credit market may be perceived as "unfair". Although variation in consumer shopping behavior is due to personal differences in perceived costs and benefits, the extent to which shopping for credit is discouraged by discriminatory credit screening practices, incomplete information, or inadequate competition is a matter of public policy.

The purpose of this study is to provide empirical evidence of the credit shopping behavior of consumers and its implications for the efficiency of the consumer credit market and for public policy. The data analyzed were derived from the 1983 Survey of Consumer Finances, a national sample of 3,824 households. The financial and socioeconomic characteristics of consumers who shopped before committing to a closed-end credit agreement are compared with those who did not. The source of credit is examined in conjunction with whether a borrower sought information on credit terms.

Basic Survey Results.

--29 percent of the consumers credit shopped, little increase over results of earlier studies.

--Nearly 80 percent of those consumers who shopped for credit were seeking lower interest rates.

--Just 55 percent of credit shoppers, even among those claiming to seek lower interest rates, borrowed from conventional "low-rate" creditors (commercial banks, thrifts, credit unions, and auto finance cos. during incentive campaigns); the balance were served by retailers, dealers, and finance companies.

--Credit shoppers who borrowed from retailers were more interested in an affordable monthly payment; most of these consumers had better incomes and education, but above average debt burdens.

--As compared to earlier studies, a greater proportion (80 percent) of credit shoppers contacted different types of creditors.

The propensity to shop for credit:

--increases with the education, income and liquid asset holdings of the consumer.

--is significantly less for consumers who have had previous borrowing relationships with commercial banks, thrifts and/or credit unions.

--is significantly less for consumers who have been rejected for credit in the past.

--is significantly lower for single parents (who typically borrowed from retailers), and for older retired persons (who typically borrowed from commercial banks, thrifts, and/or credit unions where they had prior borrowing experience).

--is significantly higher for young, single persons with no children.

--increases with the household debt burden (total and monthly debt to income) and the amount of the loan.

--is significantly lower for consumers who reside in: a) rural areas; b) the West North Central & East South Central regions of the U.S.; and c) states with more restrictive interest rate ceilings.

Implications for Current Market Developments.

Revolving Credit. The results of these analyses may have some implications for search practices on open-end credit card plans. Such plans feature repeat business by consumers who borrow against pre-established lines of credit. The incentive to shop for the most attractive terms may be limited by the small amount and the short effective term of the credit. Given the cost of seeking information, the transactions cost of switching cards, and the minimal differences in finance charges, the perceived net benefit of credit shopping may be negative.

But, a reduction in the cost of seeking and interpreting information implies that a smaller difference in interest rates is needed to yield a positive net benefit to search. New legislation, requiring more complete information on the terms of open-end credit to be disclosed at the time of solicitation, should thus increase the amount of comparison shopping for this form of credit.

Tax Reform Act of 1986. Even with lower marginal tax rates, the after-tax cost of consumer credit will increase significantly with the loss of the interest expense deduction. And, assuming their use of consumer credit has not changed over the past few years, high-income households will incur the greatest rise in costs. In this analysis, consumers with higher incomes and large liquid asset holdings had a higher propensity to shop for credit

terms. Given the tax reform rulings, these consumers are likely to have an even greater incentive to shop for lower rate sources of credit.

Low-Rate Incentive Campaigns of Automobile Finance Companies. The broad success of these aggressive campaigns are consistent with the fact that the primary attraction in most credit shopping is a lower interest rate. But, as has been suggested elsewhere, the effective finance charge for such contracts is difficult to calculate if the alternative of a cash rebate is offered. The education of consumers in finance valuation techniques is thus called for.

Increasing Competition in Financial Services. A greater percentage of the borrowers who shopped for credit in 1983 obtained information about a variety of types of creditors than did shoppers in previous years--implying effective marketing and increasing competition among providers of consumer credit. Evidence suggests, though, that loyalty or prior knowledge about the distribution of prices inhibits credit shopping for consumers with prior borrowing experience. Relationship pricing of financial products can strengthen ties with former borrowers. Borrowers who do not have extensive credit experience would be the most likely to shop and take advantage of new credit products and providers.

Nonshoppers and Market Efficiency.

Borrowers may choose not to shop for credit terms because they perceive that the costs exceed the benefits. The question is whether these nonshoppers are being inefficiently served by the market and pay higher prices for similar credit contracts than shoppers of the same credit risk. The nonshopping behavior of consumers with established relationships, particularly at low-rate creditors, does not imply market inefficiency--as they are likely to perceive no net gain from seeking a lower interest rate.

Other nonshoppers were characterized by less education, lower income, and prior rejection experience. Single parents--in this sample typically women with lower incomes, few assets, and a past record of credit rejection--did not shop. These borrowers may have perceived net costs to shopping because they realized that they were unlikely to qualify for lower-rate credit. This is not market inefficiency.

But, another factor concerning these nonshopppers must be addressed. A significant percentage of these consumers (low income and/or single parents) mentioned that they had, at least once, considered applying for credit somewhere, but did not for fear of being rejected. It may be argued that these consumers recognized a lack of creditworthiness, but the source of their perceptions often came directly from the creditor. These consumers did not apply for credit, but perceived rejection nonetheless. Dissuasion from formal application is a public policy issue.

Summary.

A consumer's perception of the value of credit shopping is heavily influenced by prior borrowing experience. Defunct regulations that in effect discouraged shopping, previous credit rejections, discriminatory screening practices, or early positive experience with "higher rate" creditors influence credit shopping practices. The education of borrowers about available alternatives and regulations that require full disclosure of credit terms and encourage price competition among creditors for all risk classes of borrowers appear to be the optimal public policy variables that will aid the development of more efficient consumer credit markets.

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Credit Research Center

EXECUTIVE SUMMARY

Working Paper No. 55

Economic Factors Associated With Delinquency Rates on Consumer Instalment Debt

A. Charlene Sullivan*

The analysis of monthly delinquency rates for open and closed-end consumer loan portfolios held by commercial banks between 1975 and 1986 supports the following conclusions:

- The level of the debt burden index (consumer credit outstanding as a proportion of disposable personal income) is significantly positively associated with the level of delinquency for a diversified portfolio of closed-end consumer loans as well as for portfolios of auto loans and of credit card outstandings.
- Delinquencies in banks' consumer loan portfolios are not statistically associated with general employment conditions (unemployment rate hours in the manufacturing work week) but the level of delinquencies for auto loan portfolios held by auto finance companies was positively and significantly associated with the level of unemployment.

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- The level of consumer sentiment did not have a statistical relationship with the level of delinquencies in portfolios of consumer loans.
- The shifts in market share in the auto loan market have had an impact of delinquencies for lenders in the auto credit business.
- The growth of consumer credit outstanding in recent years was associated with a significant decline in the level of portfolio delinquencies for commercial banks.

The results of this analysis may be used to anticipate the effects on credit risk managers of slowing in the growth of credit outstanding, changes in the use of credit associated with tax reform and further change in the market shares of different types of lenders in the consumer credit market.

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WORKING PAPER NO. 55

Economic Factors Associated With Delinquency Rates on Consumer Instalment Debt

1987

Krannert Graduate School of Management — Purdue University

ECONOMIC FACTORS ASSOCIATED WITH DELINQUENCY RATES ON CONSUMER INSTALMENT DEBT

A. Charlene Sullivan*

Abstract

Trends in loan delinquencies and losses over time and among credit types contain important information for credit managers and market analysts. The results of this study provide information about the relationship between trends in delinquency rates of portfolios of consumer credit contracts and variables related to lenders' market share, credit market growth, household financial condition and general business conditions.

The results of the analysis of monthly delinquency rates for open and closed-end loan portfolios held by commercial banks between 1975 and 1986 indicated that the debt burden measure was significantly and positively associated with delinquency rates, for all types of consumer loans analyzed. Banks' market share of consumer credit outstanding was positively associated with the delinquency rate for the average portfolio of closed-end consumer loans, suggesting that banks increased credit risk

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to win market share during the analysis period. However, the rate of growth of credit outstanding during the period was negatively associated with delinquency rates for closed-end loans.

The rapid growth of revolving credit outstanding in the last 10 years has been statistically associated with a decline in delinquency rates for the average portfolio of revolving credit held by commercial banks. The average delinquency rate for portfolios of revolving credit accounts was significantly positively associated with the household debt burden and with the unemployment rate.

ECONOMIC FACTORS ASSOCIATED WITH DELINQUENCY RATES ON CONSUMER INSTALMENT DEBT

A. Charlene Sullivan

The successful creation and trading of debt contracts is based on the premise that the probability of financial failure can be quantified and controlled for a portfolio of contracts. Trends in loan delinquencies and losses over time and among credit types contain important information for credit managers and market analysts involved in that activity. For example, in their study of the correlation of loss rates over time for various types of consumer and mortgage loans, Ford and Stanley [1985] concluded that savings institutions could reduce the probability of loan losses in their portfolios by diversifying into consumer lending. The diversification came from the fact that loss rates for portfolios of consumer loans and mortgage loans were positively but only slightly correlated.

One purpose of this study is to quantify the significance of delinquencies as a determinant of the profitability of a portfolio of consumer loans. Another purpose is to identify economic factors associated with the variation in delinquency rates for consumer instalment loans between 1975 and 1986, with special attention to differences in factors associated with portfolio delinquency data for different types of consumer loans.

I. Credit Risk Management

In theory, a value-maximizing lender would lower credit standards for new accounts accepted as long as incremental revenues exceed added costs of making the loans. Two components of the added costs of lowering credit standards are a slower collection period (or higher delinquencies) and larger bad debt losses. Changes in delinquencies and in expected loan losses associated with changing credit standards should have an impact on the price charged for contracts. And if credit losses or delinquencies are larger than anticipated, the lender's profits will suffer.

The following example is created to illustrate the nature of the relationship between delinquencies and credit losses and lender profits. Take a lender making one hundred $1,000 cash loans with an annual percentage rate of 18 percent. Assume that the lender's marginal noninterest cash costs of making the loan are 5 percent of the original balance, and assume that the cost of capital is 10 percent. Suppose the loan contracts specify that the loan principal plus interest is scheduled to be paid off completely in one instalment at the end of one year. Under these assumptions, the lender's expected before-tax benefit of making the loans, if all are paid as scheduled, is equal to

$$\text{benefit} = (-1050 \times 100) + (1180 \times 100)/(1+r)^{t},$$

where r is the lender's before-tax annual opportunity cost of capital. At r = 10 percent, the expected profit from making the loans--when no loans are expected to be delinquent or default--is:

$$= -105,000 + 118,000/1.10$$

$$= -105,000 + 107,270$$

$$= \$2,270$$

If the lender decided to take on the risk that 2.1 percent of the contracts would be totally uncollectible, he would break-even on the business (recover his investment and make the required rate of return of 10 percent).

$$0 = -105,000 + [p(118,000)]/1.10 + [1-p(0)]/1.10$$

where p = 97.8 percent or the probability that the portfolio is collectible and on schedule (1-p or 2.1 percent is the probability of default).

Assume on the other hand, that the loan payments are all collected but 30 days late. In that case the profitability of lending is reduced to $1,390, a reduction in net profit of 39 percent. Had the lender priced the loan contracts to reflect those costs of delinquency, the interest rate on the loans would have been approximately 19 percent instead of 18 percent. If the lender was faced with higher than expected delinquencies but was unable to raise interest rates he would have to raise credit standards for the portfolio to bring the profitability of the lending function back on target.

These examples show the importance in portfolio management of being able to predict collection problems for a given risk class of borrowers; price the contracts to reflect that risk; and understand how factors that are out of the lender's control might influence portfolio delinquency and default experience.

II. Determinants of Changes in the Credit Quality of a Portfolio

Delinquency rates on a portfolio of credit contracts reflect the credit quality of the portfolio under a given regime of loan servicing policies. Credit quality of a loan portfolio could change because of external changes affecting the ability or willingness of existing borrowers to repay, such as a downturn in the economy or changes in bankruptcy laws. Alternatively, it could change if management decided to take more or less credit risk on new business, to alter its collection practices on existing loans, to write off bad loans more or less aggressively, or to sell off segments of the portfolio.

Borrowers' Ability to Repay. Borrowers have an economic incentive to default on credit contracts when perceived costs of default are lower than costs of staying current on the loan. Costs of default include the present value of payments that the borrower makes as a result of remedies that the lender may exercise, the effect of default on the borrower's future ability to obtain credit, and the price at which such credit would be available. The cost of staying current on the loan is the present value of current and future payments made according to the schedule specified in the contract.

Costs of default may exceed costs of staying current if a borrower's current or expected ability to repay debts out of income is reduced by unemployment or a cutback in work hours; if the cost of living increases faster than disposable income; or if a consumer assumes an excessive amount of debt relative to income.

Credit Portfolio Management Policy. Creditors may adopt policies that will result in shifts over time in the quality of their loan portfolio. To gain market share, for example, creditors might lower credit standards and accept greater credit risk. During periods when expected profit margins are high, lenders might lower credit standards. Conversely, at times when margins are squeezed by usury ceilings, lenders might raise their standards for acceptable credit applicants, thus causing portfolio delinquency rates to decline, holding other things constant.

The Model. This study provides an estimate of a time series model of variables associated with the proportion of the number of loans delinquent 30 days and over in portfolios of consumer instalment loans. Variation in the level of average delinquency rates for consumer instalment credit is formulated as a function of consumers' ability to repay and lenders' willingness to incur credit risk. Consumers' ability to repay is formulated as a function of the debt burden ratio (consumer credit outstanding as a proportion of disposable income), the unemployment rate, consumer expectations about future economic conditions, and the general inflation rate. Lenders' willingness to incur credit risk is specified as the market share of credit outstanding held by the particular lender group and the rate of growth in credit outstanding at the same lender group. Several lag specifications of the growth rate variable were tested because a high growth rate of credit outstanding could have the immediate effect of reducing the delinquency rate on a given portfolio. However, if credit standards were relaxed to achieve the growth then delinquencies would be expected to increase in subsequent periods.

III. The Data

The data used in the analysis were seasonally adjusted delinquency rates for consumer loans held by commercial banks and auto finance companies measured monthly and made available by the American Bankers Association (ABA) and the Federal Reserve Board (FRB).

The ABA publishes a monthly composite figure that is an average of delinquency rates for eight types of closed-end consumer credit.[1] The delinquency rate for a given type of credit is calculated as the number of contracts with a payment delinquent 30 days and over, relative to the number of consumer contracts of the same type held by the same reporting banks.[2] The types of credit included in the composite delinquency rate are unsecured personal, direct auto, indirect auto, home appliance, FHA Title 1, property improvement, mobile home and recreational vehicle loans.[3] The delinquency rate for open-end bank credit cards, which is not included in the composite delinquency rate, is analyzed separately in this study.

The FRB collects and makes available delinquency data for the portfolios of the financial affiliates of the three major domestic auto manufacturers. That series is based on the number of indirect auto loan contracts outstanding at the finance affiliate with payments 30 days and over past due, relative to the total number of consumer contracts held by the reporting finance companies.

A. Trends in Delinquency Rates

The Composite Rate. The composite ABA delinquency series may be a leading indicator of the general level of economic activity if it is a reflection of the health of household balance sheets and therefore households' ability and willingness to spend.[4] The composite delinquency rate for closed-end consumer loans at commercial banks fluctuated around an average level of 1.5 percent between 1965 to 1973 (Exhibit 1). Until 1974 the composite delinquency rate was always below 2 percent. Since then there has been an increase in the delinquency rate and the composite rate did not fall below 2 percent again until June 1983. For the entire period between 1974II and 1983IV, the average delinquency rate was 2.4 percent, a 56 percent increase over the average for the previous ten year period.

The present study identifies variables associated with consumer loan delinquency rates from 1975 to 1986. This period was characterized by intervals of high inflation as well as by changes in consumer credit regulations that impacted the competitive environment for credit, and in the economic characteristics of consumers using credit.[5]

The Individual Delinquency Series. Delinquency rates for each type of consumer credit included in the composite index for commercial banks follow somewhat different patterns over time. An examination of the individual series shows the variability in delinquency rates that can be diversified away, to some extent, for lenders' holding portfolios of various types of consumer loans. The ABA delinquency series for two groups of consumer

Exhibit 1

Closed-end Consumer Loan Delinquency Rates
At Commercial Banks
(seasonally adjusted; monthly)

SOURCE: American Bankers Association

credit are charted in Exhibits 2 and 3. Delinquency rates for selected types of secured loans (direct and indirect auto) are shown in Exhibit 2, while Exhibit 3 contains delinquency rates for unsecured loans (personal loans, bank credit cards and other revolving credit.)

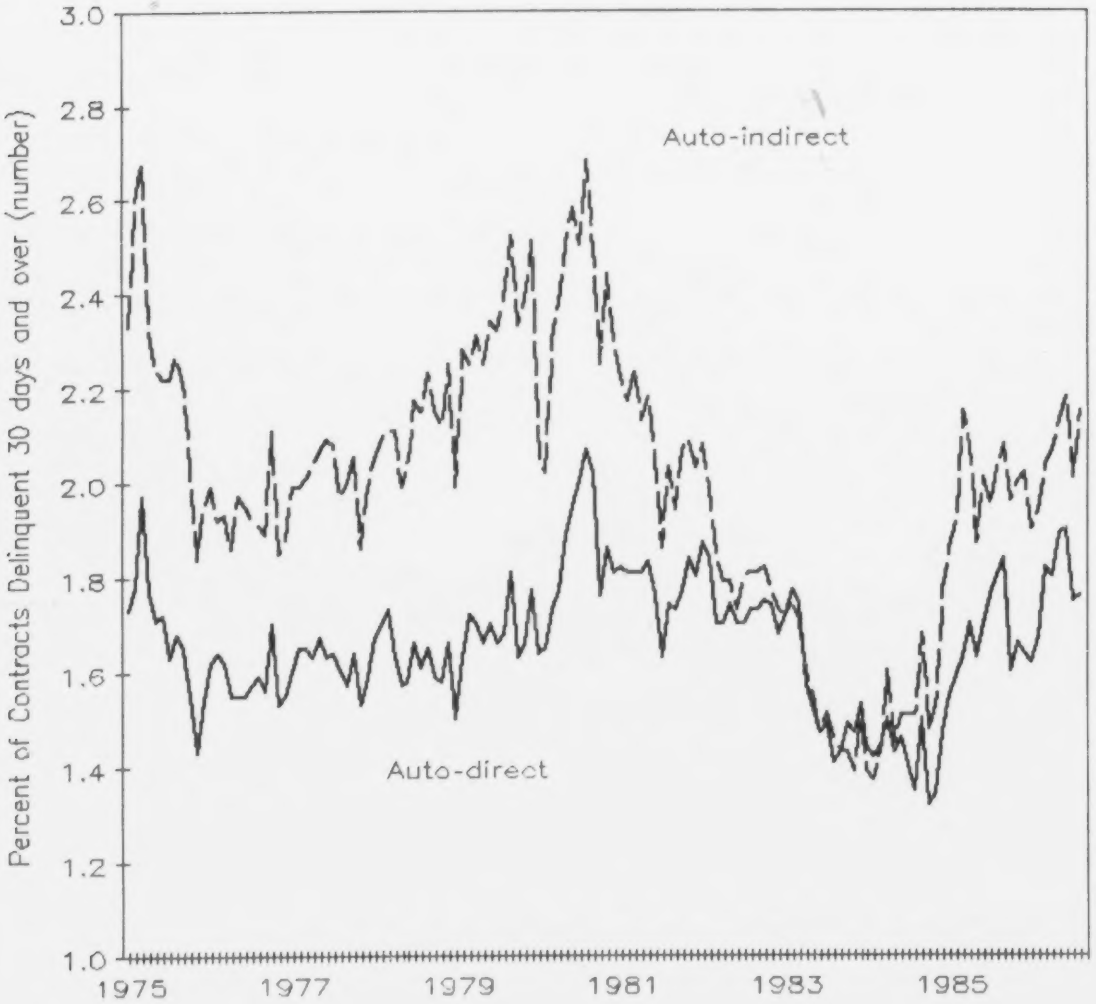
Between 1975 and 1985 the nature of credit risk for the two types of auto loans held by commercial banks changed (Exhibit 2). The difference in the credit quality of direct versus indirect auto loans disappeared between 1982 and 1984. Indirect customers became more like direct customers although historically, indirect borrowers had been less creditworthy (that is, the probability of delinquency was higher) than was the case for direct loan customers. In 1985, the more traditional distinction between delinquency rates for the two types of auto loans reappeared but the spread between them was not as large as it had been prior to 1985. These shifts in the risk character of auto loan portfolios held by commercial banks may be attributed to the changing competitive environment for auto credit, especially for indirect auto credit.

Unsecured loans which tend to be small are more risky than larger, secured auto loans. Reflecting this risk differential, unsecured personal loans showed much higher delinquency rates (Exhibit 3) than either direct or indirect auto loans (Exhibit 2). Moreover, delinquency rates on personal loans at banks were higher than for credit cards or other revolving credit (Exhibit 3).

Bank credit cards may have exhibited a lower default rate relative to unsecured personal loans because of the broad spectrum (in terms of risk) of consumers that hold such cards. Many cardholders use their bank card

Exhibit 2

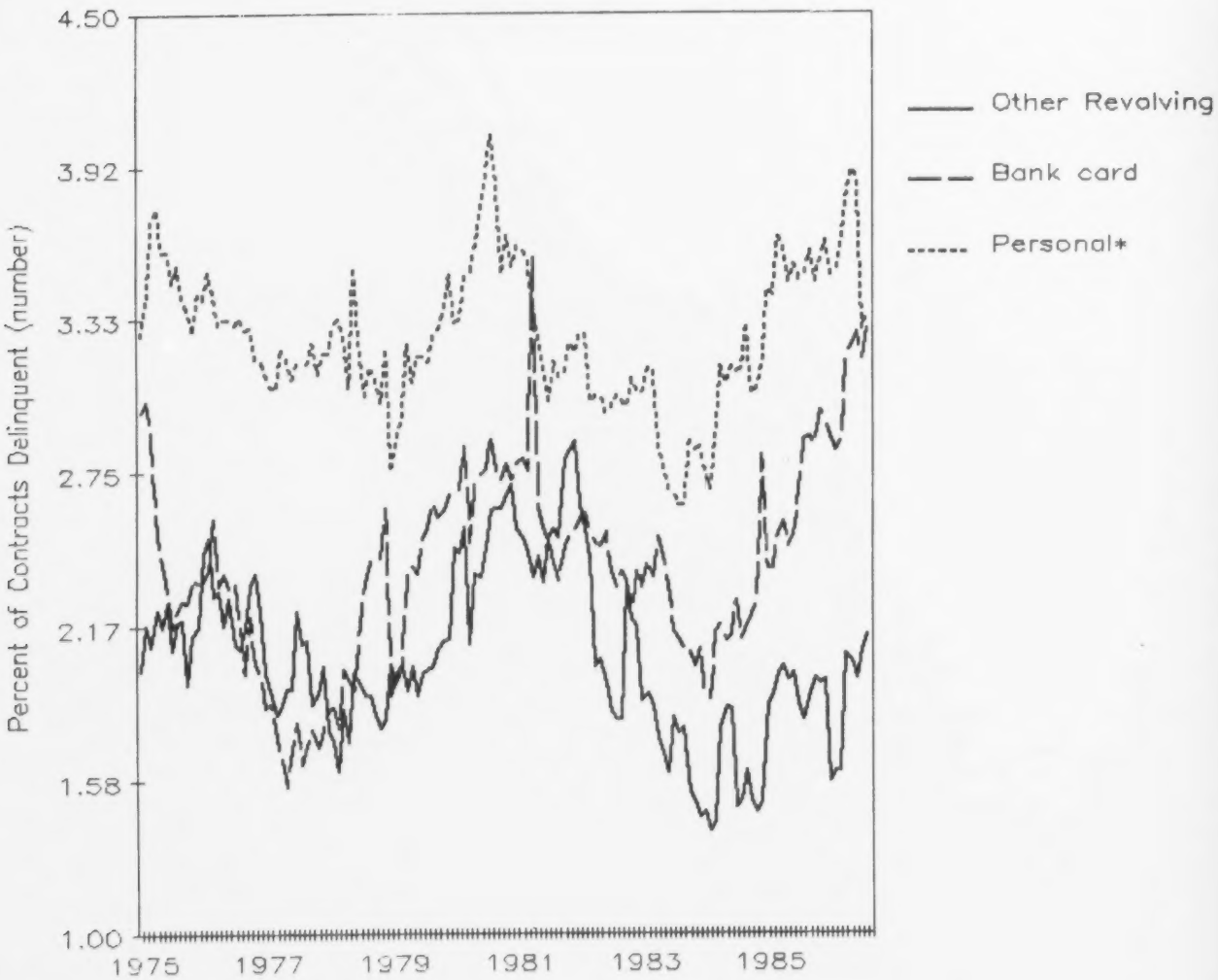
Delinquency Rates on Auto Loans Held by
Reporting Commercial Banks
(seasonally adjusted; monthly)



SOURCE: American Bankers Association

Exhibit 3

Delinquency Rates on Unsecured Consumer Loans
Held by Reporting Commercial Banks
(seasonally adjusted; monthly)



*As of 10/83 data for PERSONAL loans incude home appliance loans that were previously reported separately.

SOURCE: American Bankers Association

accounts as a convenient transaction medium and the credit risk of this group is by definition, virtually nil. The adjusted delinquency rate for a portfolio of revolving credit card outstandings, based solely on the percent of accounts that revolve rather than total accounts that include convenience as well as revolving credit, is dramatically higher than that for unsecured personal loans (Table 1). These adjusted rates give an idea of the possible impact on portfolio delinquencies of bank card pricing policies that would discourage the use of that product by the "convenience user."[6]

IV. Factors Related to the Level of Delinquency Rates

A. Analysis of Composite Delinquency Rates

In the analysis of the composite consumer loan delinquency rate (Table 2) the overall equation was significant and the explanatory power of the model was high ($R^2 = .78$). However, most of the coefficients of variables related to borrower ability to repay debts were not significantly different from zero. Only the coefficient of the debt burden variable was significant and positive. Holding other things constant, when the debt burden measure increased, the credit quality of portfolios of all types of closed-end consumer loans held by banks deteriorated.

Between 1976 and 1986, the share of total consumer credit outstanding held by commercial banks declined from almost 50 percent to 44 percent. This loss in market share was associated with a significant decline in delinquencies for the average total consumer credit portfolio of banks:

Table 1

Recalculation of Delinquency Rates on Open-end Credit Accounts at Reporting Banks

		Delinquency Rates on Portfolios		
	Proportion of accounts that revolve	Bank Cards (revolving and convenience)	Adjusted Bank Cards (revolving only)	Unsecured Personal Loans
	(1)	(2)	(3)	(4)
1981	0.653	2.53	3.87	3.2
1982	0.661	2.38	3.60	3.04
1983	0.699	2.08	2.98	2.84
1984	0.683	2.81	4.11	3.16
1985	0.703	2.95	4.20	3.63

1. Source: Federal Reserve Functional Cost Analysis 1981-1985. Figure reflects an average of data for credit card banks of different sizes.

2. Source: American Bankers Association year end data.

3. Column 2 divided by Column 1.

4. Source: American Bankers Association year end data.

the coefficient for the market share variable is significant and positive in the analysis of the composite delinquency rate.

When the growth rate of credit increased, the closed-end consumer loan portfolio delinquency rate for commercial banks declined significantly, holding other things constant. Coefficients for lagged values of the growth rate in bank portfolios were not significant. During the analysis period, portfolio managers achieved growth without reducing portfolio credit quality. This result could reflect the effects of inflation, deregulation and federal income taxes on incentives to borrow for households that might not have previously used consumer credit.[7]

Several recent analyses of the debt burden ratio have suggested that changes in consumer use of credit and in the types of credit available have reduced the value of this statistic as a measure of consumer ability to repay.[8] The high level of significance of the relationship between the delinquency rate for a diversified portfolio of closed-end consumer credit at banks and the debt burden measure reinforces the value of the debt burden measure is a valuable coincident indicator of the ability of households' borrowing from banks to manage their indebtedness and a robust indicator of the quality of consumer loans outstanding issued by commercial banks.

In their analysis of the delinquency rate for closed-end consumer loans between 1951 and 1974, Peterson and Luckett (1976) found that portfolio credit quality was significantly associated with variables related to employment conditions. The lack of association of the employment variables in the 1975-86 period may reflect (a) the decline in

Table 2

Analysis of Delinquency Rates on Consumer Instalment Credit at Commercial Banks (monthly rates, January 1976 to August 1986)

Variables	Coefficients/ (t-statistics)
Hours worked per week	-0.02 (-0.97)
Unemployment	-0.003 (-0.07)
Inflation	-0.32 (-0.25)
Debt burden	5.80* (1.92)
Sentiment	-0.003 (-1.15)
Market share	4.16* (2.42)
Growth rate	-0.006* (-2.97)
Constant	0.90 (0.39)
Adjusted R^2	0.78
Durbin-Watson	2.26
	C-O

*Significant at the five percent level.

C-O = Cochrane-Orcutt transformation.

Variable	Definition
Hours worked per week	Average total hours worked per week in manufacturing sector, including overtime hours. Source: Current Business Statistics
Unemployment	Percent of total civilian labor force unemployed. Source: Bureau of Labor Statistics
Inflation	Annual inflation rate based on Consumer Price Index. Source: Business Conditions Digest
Debt Burden	Ratio of total consumer credit outstanding to disposable personal income. Sources: Federal Reserve Board and Current Business Statistics
Sentiment	Index of Consumer Sentiment. Source: Created from monthly surveys of consumers by Survey Research Center, University of Michigan
Market Share	Share of type of consumer credit outstanding held by relevant type of institution. Source: Federal Reserve Board
Growth Rate	Annualized growth rate of type of credit outstanding held by type of institution Source: Federal Reserve Board

importance of the manufacturing sector (the hours in the work week variable is based on employment conditions in the manufacturing sector) or (b) the coinsurance benefits of having two workers in a family (two-income households which have become more numerous and are significant users of consumer credit).[9]

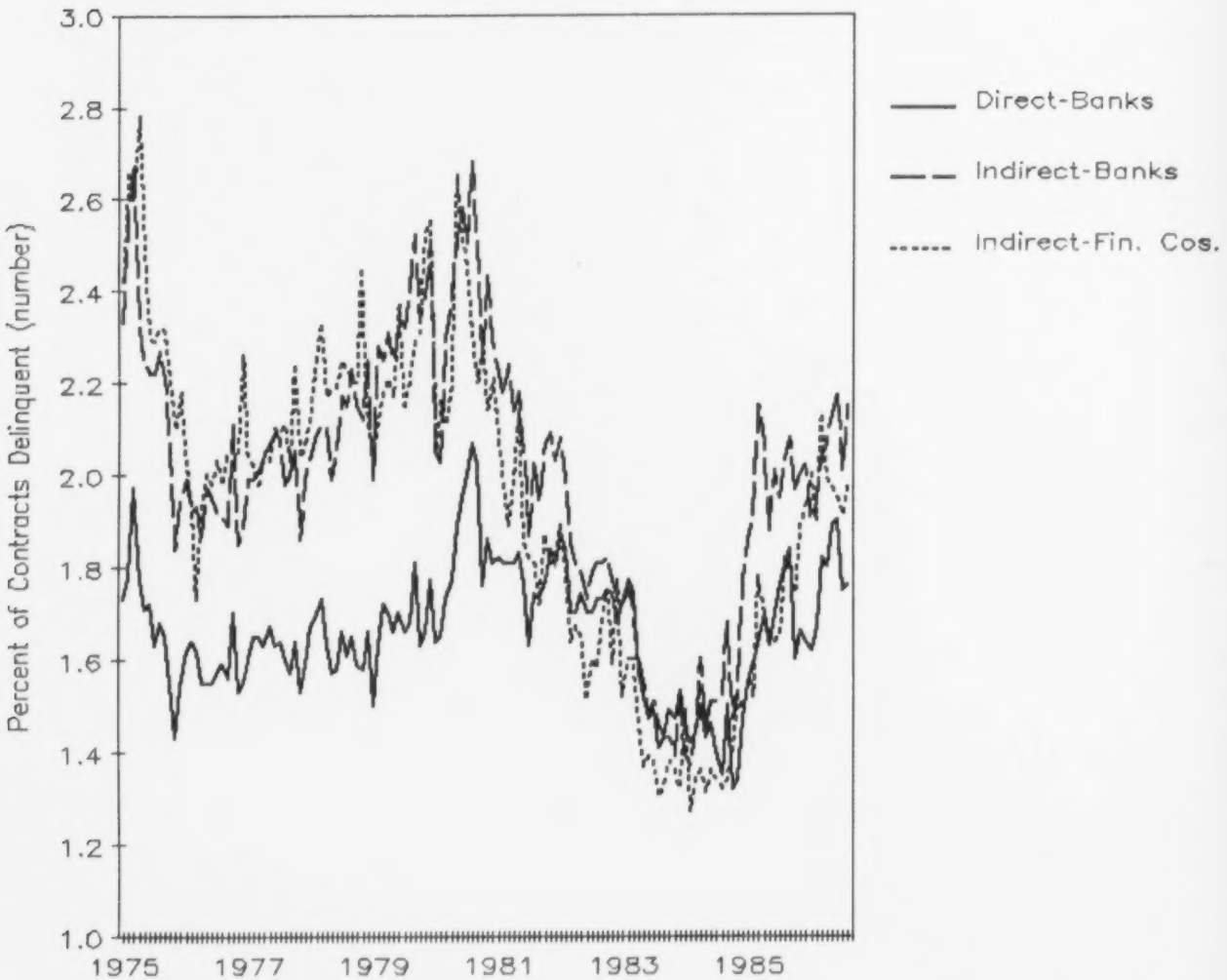
B. Analysis of Delinquency Rates on Auto Credit

Auto credit makes up about two-fifths of total consumer credit outstanding, and accounts for the bulk of the dollar volume of all secured consumer credit outstanding. Because the presence of security raises the cost of default for the borrower, delinquency rates on secured loans may be less associated with macroeconomic conditions than delinquencies on unsecured contracts. Also, the delinquency rate for secured loans may be lower than that for consumer loans in general because of the higher average credit quality of borrowers who have assets to offer as collateral.

During the study period, many developments changed the positions of various competitors in the market for auto credit and the profile of consumers using credit to buy a car.[10] From 1975 to 1986, there was little difference between rates of delinquency on indirect auto credit at commercial banks and auto finance companies (Exhibit 4). Until 1982 portfolios of indirect auto contracts (regardless of holder) had higher delinquency rates than portfolios of direct auto contracts (Exhibit 2). In 1982 however, the portfolio risk for the two lender groups and the two types of contracts converged. Factors associated with these trends are analyzed in the next section.

Exhibit 4

Auto Loan Delinquency Rates at Commercial Banks and Finance Companies
(seasonally adjusted; monthly)



SOURCE: American Bankers Association and Federal Reserve Board

Indirect Auto. From 1975 to 1986, delinquency rates for the indirect auto loan portfolios held by auto finance companies and commercial banks were significantly and positively associated with the consumer debt burden ratio (Table 3). Neither the unemployment rate nor the inflation rate were significantly associated with delinquencies for indirect auto loans held by commercial banks, although the coefficients of both variables were significantly positive in the analysis of the auto finance company delinquency rates. The significance of these variables in the equation for auto finance companies may indicate that the customers served by auto finance companies are more susceptible to changes in general business conditions than customers served by banks--characteristics that would make portfolio risk for auto finance companies higher than that for banks.

During the period included in the analysis, the average maturity of auto credit contracts increased dramatically and auto finance companies also offered credit contracts with below-market interest rates to increase auto sales. Both of these developments affected the growth of credit outstanding and the market shares of auto credit held by finance companies and banks. In the analyses of delinquency rates on indirect loan portfolios, the coefficients of the market share variables were significant but had opposite signs for the two competitors. The market share of auto credit held by auto finance companies increased from 19 percent in 1976 to almost 40 percent in 1986. During the same time period, the share of auto credit held by commercial banks declined from 50 percent to approximately 44 percent. The sign of the coefficient of the market share variables suggests that auto finance company gains in market share improved the

Table 3

Analysis of Delinquency Rates on Indirect Auto Loans
(monthly rates, January 1976 to August 1986)

Variables	Commercial Banks Coefficients/ (t-statistics)	Auto Finance Companies Coefficients/ (t-statistics)
Hours worked per week	-0.001 (-0.60)	-0.02 (-0.66)
Unemployment	0.04 (0.93)	0.12* (2.48)
Inflation rate	1.82 (1.44)	3.00* (2.18)
Debt burden	13.99* (4.25)	19.47* (4.91)
Sentiment	-0.003 (-1.26)	-0.003 (-1.02)
Market share	2.34* (3.58)	-3.50* (-5.54)
Growth rate	-0.005* (-3.10)	-0.0001 (-0.16)
Constant	-2.86 (-1.23)	-3.46 (-1.40)
Adjusted R^2	.87	.87
Durbin-Watson	2.15	2.26
	C-O	C-O

*Significant at the five percent level.

C-O = Cochrane-Orcutt transformation.

overall quality of auto finance companies' loan portfolios without having an adverse effect on the risk of the indirect loan portfolio held by banks. As banks' market share declined, the portfolio delinqeuncy rate also declined.

The coefficient of the growth rate variable was significantly negative for indirect auto loan portfolios at commercial banks but insignificant in the analysis of delinquency rates in auto finance company portfolios. Again, the coefficient of the growth rate variable suggests that during the analysis period, lenders were not taking more credit risk as they expanded the quantity of auto credit outstanding. This result may be attributable to the value of lengthening maturities on contracts as a means of making more credit available while reducing the cost of credit, in terms of monthly cash flows and thus controlling delinquency risk.

Direct Auto. Delinquency rates for direct auto loans held by commercial banks were a significant positive function of the debt burden ratio but were not significantly associated with other variables influencing borrower ability to repay. These include the unemployment rate, hours per work week, rate of inflation, or consumer sentiment (Table 4). It appears from these results that customers with direct auto loans from commercial banks were fairly well insulated from fluctuations in the business cycle. The delinquency rate was a significant negative function of the growth rate of credit outstanding but was not associated with the market share variable.

Table 4

Analysis of Delinquency Rates on Direct
Auto Loans From commercial Banks
(monthly rates, January 1976 to August 1986)

Variables	Coefficients/ (t-statistics)
Hours worked per week	-0.02 (-1.43)
Unemployment	0.02 (0.81)
Inflation Rate	0.57 (0.63)
Debt Burden	4.51* (1.93)
Sentiment	-.001 (-0.79)
Market share	0.28 (0.60)
Growth rate	-0.004* (-3.25)
Constant	1.09 (0.67)
Adjusted R^2	0.74
Durbin-Watson	2.13
	C-O

*Significant at the five percent level.

C-O = Cochrane-Orcutt transformation.

C. Delinquency Rates for Bank Credit Cards

The average annual rate of growth (based on monthly data) of revolving credit outstandings held by commercial banks during the period included in the study was 17.5 percent, almost double the average growth rate of closed-end consumer instalment credit at the same reporting group. The phenomenal growth in the amount of revolving credit outstanding has raised concerns about the quality of credit card portfolios.

This analysis of factors associated with delinquency rates on portfolios of revolving credit accounts at banks shows a significant positive association with the consumer debt burden ratio and with the unemployment rate (Table 5). But as the rate of growth of revolving credit outstanding increased, portfolio delinquency rates declined. These results imply that events such as tax reform, market saturation, or a slowdown in the economy which would slow the rate of growth of revolving credit outstanding could have a negative effect on the quality of credit card portfolios.

VI Summary

At the margin, the amount of credit risk incurred by a lender--as measured by costs associated with late payments and bad debt losses--is determined by the expected incremental benefit of making the loan. As those credit costs increase, interest rates must be raised or credit policies changed to bring costs and benefits back in balance. Thus, the amount of delinquency risk incurred is a reflection of a management decision.

Table 5

Analysis of Delinquency Rates on
Bank Card Credit
(monthly rates, January 1976 to August 1986)

Variables	Coefficients/(t-statistics)
Inflation rate	0.80 (0.36)
Debt burden	26.33* (4.23)
Sentiment	-0.005 (-1.32)
Growth rate	-0.003* (-2.22)
Growth rate (t-1)	0.001 (0.66)
Unemployment	0.11* (1.90)
Constant	-3.14 (-0.97)
adjusted R^2	0.85
Durbin-Watson	2.31
	C-O

*Significant at the five percent level.

C-O = Cochran-Orcott transformation

However, delinquencies in consumer credit portfolios are dynamic--changing not simply with shifts in credit management policies but also with macroeconomic conditions affecting the ability of consumers to repay debt.

This study provides an analysis of the effect of management policies and macroeconomic variables on delinquency rates on consumer loan portfolios. For all types of consumer credit analyzed, ratios of consumer debt to disposable income were significantly and positively associated with the portfolio delinquency rates. Employment conditions, the inflation rate, and an index reflecting consumer optimism or pessimism about general business conditions were not associated with delinquency rates on closed-end consumer loan portfolios held by commercial banks. However, delinquency rates for auto loans held by auto finance companies and for credit card portfolios were positively associated with some of the same variables.

The loss of market share by commercial banks between 1975 and 1986 (largely due to changes in the auto credit market) was associated with an improvement in the quality of bank closed-end consumer loan portfolios. And high rates of growth for all types of consumer credit held by commercial banks had a positive effect on portfolio quality between 1975 and 1986. The growth in credit outstanding during that period has been partly attributed to the increased use of credit by high income consumers--a scenario which is consistent with our results and with the positive effects of growth on portfolio risk.

Shifts in market share in the auto credit market between 1980 and 1986 appear to have reduced portfolio risk for auto finance companies--a

reduction that was not offset by any negative effects of rapid growth in their holdings. In general however, the quality of auto loan portfolios held by auto finance companies during the period deteriorated significantly with increases in unemployment and inflation.

Delinquency rates on revolving credit portfolios increased significantly with the consumer debt burden and with the unemployment rate. And the rapid rate of growth of revolving credit during the last ten years has had the effect of keeping the portfolio delinquency rate low.

The results of this analysis suggest that changes in economic conditions that are accompanied by a slowing of the rate of growth in consumer credit may be associated with significant deterioration in consumer credit portfolios. Credit growth has been achieved in the last 10 years with products that have made credit more attractive to better quality credit customers and with innovations such as lengthening loan maturities. Externalities such as tax reform could slow the growth trend, leaving lenders with less ability to achieve portfolio growth without taking more credit risk or without cutting prices.

Footnotes

[1]The rate is a weighted average based on the number of loans outstanding.

[2]The sample of surveyed banks has not been constant over time.

[3]In the fourth quarter of 1983, the formula for the composite delinquency rate changed. The home improvement and FHA title I series were consolidated. Home appliance and unsecured personal were also consolidated and a second-mortgage loan series was added.

[4]See Moore and Klein, Chapter 6.

[5]See Sullivan, A. C., "Consumer Credit: Are There Limits?" Journal of Retail Banking Vol. 8, No. 4 Winter 1986-87, pp. 5-18.

[6]See Canner and Cyrnak.

[7]See note 4 above.

[8]See Luckett and August (1985), Pearce (1985).

[9]Sullivan and Worden (1986) found that two-income households were more likely to use consumer credit and used more credit relative to income, than other types of households.

[10]See Luckett and Westfall.

Bibliography

Canner, Glenn B., and Anthony W. Cyrnak. "Determinants of Consumer Credit Card Usage Patterns." Journal of Retail Banking 8 (Spring/Summer 1986): 9-18.

Dunkelberg, W.C., and Debra Drecnik Worden. "Quality of Consumer Credit [1986]." Krannert Graduate School of Management, Purdue University. Photocopy.

Ford, John K., and Thomas O. Stanley. "Consumer Lending Alters the Risk and Return of Loan Portfolios." Savings Institutions (November 1985): 52-55.

Luckett, Charles A,. and James D. August. "The Growth of Consumer Debt." Federal Reserve Bulletin (June 1985): 389-402.

Luckett, Charles A., and Janice S. Westfall. "Recent Developments in Automobile Finance" Federal Reserve Bulletin (June 1986): 355-365.

Moore, G. H., and P. A. Klein. The Quality of Consumer Instalment Credit National Bureau of Economic Research, New York, 1967.

Pearce, Douglas K. "Rising Household Debt in Perspective." Economic Review Federal Reserve Bank of Kansas City, Vol. 70 (July/Aug 1985): 3-17.

Peterson, Richard L., and Charles A. Luckett. "Delinquency Rates on Consumer and Mortgage Credit: Their Determinants and Impact." Working Paper No. 5. Lafayette, IN: Credit Research Center, Purdue University, 1976.

Sullivan, A. Charlene. "Consumer Credit: Are There Limits." Journal of Retail Banking 8 (Winter 1986-87): 5-18.

_____. "Tax Reform and Consumer Credit [1986]." Credit Research Center, Purdue University. Photocopy.

Sullivan, A. C., and Debra Drecnik Worden. Economic and Demographic Factors Associated With Consumer Debt Use. Working Paper No. 52. Lafayette, IN: Credit Research Center, Purdue University, 1986.

APPENDIX

Delinquency Rates on Indirect Auto Loans at Finance Companies
January 1973 to August 1986

Number of Loans Delinquent 30 Days and Over as a Percentage of Number of Loans Outstanding
(seasonally adjusted)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
1973	2.44	2.31	2.32	2.22	2.22	2.25	2.21	2.24	2.25	2.37	2.46	2.38
1974	2.41	2.58	2.54	2.56	2.68	2.62	2.62	2.62	2.58	2.64	2.55	2.81
1975	2.42	2.66	2.60	2.78	2.49	2.30	2.29	2.32	2.31	2.19	2.10	2.18
1976	2.03	1.94	1.73	1.94	2.00	1.98	2.03	1.98	2.04	2.03	2.05	2.26
1977	2.04	2.02	1.98	2.05	2.03	2.10	2.09	2.11	2.03	2.24	2.04	2.07
1978	2.13	2.24	2.33	2.17	2.19	2.19	2.25	2.23	2.20	2.20	2.45	2.14
1979	2.03	2.12	2.18	2.21	2.17	2.37	2.14	2.20	2.29	2.30	2.53	2.55
1980	2.05	2.16	2.11	2.19	2.65	2.52	2.45	2.31	2.20	2.28	2.14	2.21
1981	2.09	1.98	1.89	1.98	2.14	1.85	1.82	1.81	1.72	1.87	1.81	1.83
1982	1.89	1.79	1.64	1.67	1.65	1.51	1.60	1.58	1.68	1.75	1.59	1.77
1983	1.52	1.60	1.60	1.47	1.37	1.39	1.38	1.30	1.33	1.38	1.36	1.32
1984	1.49	1.27	1.34	1.36	1.31	1.36	1.34	1.32	1.34	1.40	1.52	1.49
1985	1.56	1.52	1.78	1.70	1.63	1.64	1.65	1.82	1.79	1.74	1.89	1.93
1986	2.00	1.90	2.13	1.99	1.97	1.95	1.91	1.97				

Source: Board of Governors of the Federal Reserve System.

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